

THURSDAY, MARCH 29, 1877

## PALMÉN ON THE MIGRATION OF BIRDS

*Ueber die Zugstrassen der Vögel.* Von J. A. Palmén, Docent der Zoologie an der Universität Helsingfors. Mit einer lithographirten Tafel. (Leipzig: Engelmann, 1876.)

**G**RANTING it to be true that truth never dies, it is undeniable that error is hard to kill. A notable instance of this last assertion is furnished by the infatuation which possesses so many people, otherwise, perhaps, not unreasoning, to believe that more or fewer of the birds which commonly frequent these islands in summer, pass the winter in a torpid state—"hibernate," as they are pleased to say. Vainly have travellers or residents on the shores of the Mediterranean, or in the interior of Africa, told us over and over again, how that as the hot weather comes to an end with us, our cuckoos, our swifts, our swallows—nay, almost all our summer birds—come crowding southwards. As vainly have the same observers recorded the northward journeys of the same species, though under somewhat different conditions, on the approach of our spring. Of course, no one who merits the title of an ornithologist disregards the plain evidence thus afforded, or entertains a single doubt as to what it proves—however strongly he may recognise the fact that we know little of the paths taken by the migrants, and next to nothing of the faculty whereby they ordinarily reach their ancestral summer-home. But there are not a few persons enjoying among the vulgar of all classes the reputation of being ornithological authorities, and there are thousands of the general public, who still hanker after the ancient faith in "hibernation." It may be said that it is but lost labour to attempt to bring such people to reason, and so, possibly, it is. Still, the apparent gravity with which this absurd notion is from time to time propounded, renders it necessary that its folly should be as often exposed, lest the pertinacity with which it is urged gain for it adherents among those who think that, as they encounter no refutation of it, it may or must be true, and the testimony in its support unanswerable. As a rule, there seems to be an outbreak of the "hibernation" mania every two years or so. It nearly always presents the same essential features. Some one, who with the multitude passes for an ornithologist, sends to a newspaper a second or third-hand story of some nameless person who in some nameless place found a number of torpid swallows in the chink of a chalk-pit, or a drowsy land-rail in a haystack—or, on a log of wood being laid on the fire, of a cuckoo that woke from its slumber and, emerging from its retreat, sat on the hob, regardless of its singed plumage and cheerfully singing its accustomed song. Occasionally a brilliant imagination, and the desire of supplying some grateful novelty suggests a diversion of the details, and the swallows are dragged from a horse-pond in a casting-net, or have got themselves into an eel-pot—or the cuckoo is discovered as the billets are being split. The story, which can be fairly compared with the tales of witches' imps, and of our dear old friend the antediluvian toad-in-a-hole, is repeated in many newspapers, and countless correspondents write letters to their respec-

tive "organs," citing parallel cases of which they have heard from their grandmothers, and wonder why "Professor" Darwin, Mr. Buckland, or the great "Doctor" Owen, do not favour the public with their views on the matter.

A delightful example of all this occurred not many weeks since, and one, moreover, marked by so much originality of conception as to reveal the hand of a master. A reverend gentleman published the evidence of a friend's friend, or that friend's friend's friend (there was a charming uncertainty on this point, and the final friend was of course nameless), who watched "a brood of young swallows too weakly to be able to follow their parents in their migration." (Here it is to be observed that the "hibernation" advocates of late years don't deny migration *in toto*, and that, as explained by the reverend storyteller, the "swallows must have been martins!") "So the old birds left them in their nests and plastered them up with mud." To cut the story short, it is enough to observe that the ingenious and considerate parents were (as they expected) rewarded, on their return next spring, by finding their offspring "none the worse for their six months' incarceration," and after this happy ending to the tale had been told, the sympathies of the British public were duly roused, and the "hibernation" mania was ready to run its usual course. On this occasion, however, its symptoms were more pronounced than usual, and a philosophical contemporary of ours, always prone to the analysis of conduct—perhaps also seeing in the story a fresh argument against experiments on live animals—hastened to record the story among the news of the week, though admitting that it was "not much in the way of evidence." This admission, however, was prefaced by the very curious statement that "It is at least quite conceivable that a creature which had been a hibernator generations ago, and which had since discovered the preferability of migration to a warmer climate, should yet be able to return to its old habit in case of need." This remark might be allowed to pass if it had only been proved that any bird, since birds ceased to be reptiles, ever had been a "hibernator." As that is not the case it may be sent instantly to the limbo of false hypotheses. Still the admission roused the remonstrances of a correspondent of the same journal, for he not only "was inclined to think" the story "authentic," but adduced in its support an agreeable variation of the fable. His gardener had assured him "that he had himself seen what he described, 'layers of young swallows in a hibernating state, when, taking up the flooring of some house in that parish [Thorpe Arch] during winter.' *O fortunatos nimium!* What sights bless the eyes of gardeners! Layers of young swallows under our boards or bricks! How were the rats and mice kept from feasting on their tender bodies? And then if one did happen to die before the day of release, how sweet would be that superimposed chamber! Inviting as the theme is, we must leave it to record the further progress of this maniacal outbreak.

The next portion of our history introduces us to a new world and to a family of birds never before accused of "hibernating." A second correspondent of the same journal, writing under the honoured initials "R. N.," spins a yarn, fit for the fo'castle (if there happen to be an audience of marines), and tells how humming-birds at

Port Montt (*sic*) pass the winter in hollow trees, and are often brought into the houses cold and stiff, perfectly dormant, and yet when revived by the warmth, able to fly about the room. They only need a refrigerating ship to be brought to, and "acclimatised" in, Ireland, or kept at the Crystal Palace. This is "R. N.'s" idea, not ours, but he makes it, we doubt not, in all sincerity. We now fully expect that the next bird charged with "hibernating" will be an ostrich. The phoenix, if he could be found, would certainly not be safe, but then he is dormant already. Even now it is perhaps not too late to injure the reputation of the dodo, and announce that a Rip van Winkle of the species has been "hibernating," like a tenrec, in some secluded rift of the rocks in Mauritius.

That truth will prevail in due time there can be no doubt, and these tales of "hibernation" will serve to amuse future generations, even as that marvellous and circumstantial account of the evolution of Bernacle-geese from shell-fishes now causes mirth to us—mirth mingled with regret at the stupid credulity of our quasi-scientific forefathers. Yet hardly so. It would be an injustice to the venerable Gerard to put on a par with him these story-tellers of to-day. The old herbalist had but little light, but what little light he had he did not neglect. Our contemporaries shut their eyes and ears to that which is before them. Their wilful ignorance is absolutely criminal, therefore shall they receive greater condemnation. If any of them is open to conviction, let him reflect on this single fact. The young cuckoo, when we last see it in autumn, is clad in a plumage of reddish-brown or liver-colour. When cuckoos reappear in spring, they are, almost without exception, in their proverbial "grey." It is obvious, then, either that the young birds have moulted in the meanwhile, or else they have perished in the process of "hibernation." This latter alternative would soon put an end to the species, and cannot for a moment be entertained. But as regards the former, every physiologist will agree that while an animal is torpid, all growth is suspended—yet on the "hibernation" theory, these young cuckoos must have put off their nestling feathers, and grown those characteristic of maturity, during the time when nearly all the animal functions are at rest. Therefore it simply stands that "hibernation" in the case of the cuckoo is an impossibility. The same, too, with swallows. It is known that they renew their feathers about Christmas. The plumage of the young swallow in its first autumn does not differ so strikingly from that of the adult, as it does in the cuckoo, but any one pretending to ornithological knowledge, must know that the swallow of the preceding year can be equally declared to have changed its feathers since the last autumn, and indeed the fact of this winter-moult has been observed in caged birds, and recorded many years since by Mr. James Pearson, whose account, verified by Sir John Trevelyan, was published by Bewick eighty years ago ("Land Birds," p. 249, Ed. 1797). Hence it follows that neither swallows nor cuckoos—thus moulting in the winter months—do, as has been asserted, "hibernate."

It is indeed somewhat humiliating to be at this day refuting an error which has been so often refuted before, but necessity knows no law, and the widely-spread fallacy creates the necessity. Furthermore, this protest against the sciolism of the age has led us away from our parti-

cular object, which is to notice the remarkably careful and painstaking work of Herr Palmén, originally published in Swedish in 1874, and now appearing in a German translation, which will have many more readers. This treatise does not indeed (as will be seen from its title) profess to treat of more than one branch of the migration question. Its scope is properly limited to a consideration of the routes taken by birds of passage in their migration; but on that account it is none the less a valuable contribution to the already extensive literature of the subject, and in this German version the author appends some remarks of more general interest. He seems to have availed himself of all the information, as to his main point, that he could collect, and the wonder, perhaps, is that, living in Finland, he has been able to amass so much. His work is weak, it must be confessed, in detail as to the migratory birds of our own islands, but, as we think, from no fault of his own, since most of those who delight to consider themselves "British Ornithologists" are content to stand on the ancient ways of their forefathers, and to disregard everything that happens beyond the "silver streak" as entirely as if it belonged to another planet. Thus we doubt much if he would have greatly gained by studying the various contributions to "British" ornithology that have appeared since 1856, when the last edition of Garrell's standard work was completed. We must, however, hold that Herr Palmén's assignment of routes to the migratory birds of North-Western Europe is almost purely conjectural. We do not say it is erroneous—far from that. There is much in it which will very likely be proved true whenever British ornithological observers shall be at the pains to observe to some purpose; but, at present, his views can, from the nature of the case, be only accepted provisionally. He has far different and more solid ground to go upon when he treats of the migratory birds of Eastern Europe, and especially of the Russian Empire—whether European or Asiatic, and every ornithologist owes Herr Palmén a debt of gratitude for the compendious abstract he gives from the mighty works of Pallas's successors, and notably from those of Dr. von Middendorff.

As regards the routes taken by the migratory birds of the Palearctic region, Herr Palmén's investigations have been so concisely summed up by a recent writer in the last edition of the "Encyclopædia Britannica" (iii. p. 768) that we take the liberty of here transcribing them as there given. These main routes are said to be *nine* in number:—

"The first (A—to use his notation), leaving the Siberian shores of the Polar Sea, Nova Zembla, and the North of Russia, passes down the west coast of Norway to the North Sea and the British Islands. The second (B), proceeding from Spitsbergen and the adjoining islands, follows much the same course, but is prolonged past France, Spain, and Portugal to the west coast of Africa. The third (C) starts from Northern Russia, and, threading the White Sea, and the great Lakes of Onega and Ladoga, skirts the Gulf of Finland and the southern part of the Baltic to Holstein and so to Holland, where it divides—one branch uniting with the second main route (B), while the other, running up the valley of the Rhine and crossing to that of the Rhone, splits up on reaching the Mediterranean, where one path passes down the western coast of Italy and Sicily, a second takes the line by Corsica and Sardinia, and a third follows the south coast of France and eastern coast of Spain—all three



paths ending in North Africa. The fourth (D), fifth (E), and sixth (F) main routes depart from the extreme north of Siberia. The fourth (D) ascending the river Ob, branches out near Tobolsk—one track, diverging to the Volga, descends that river and so passes to the Sea of Azov, the Black Sea, and thence by the Bosphorus and Ægean, to Egypt; another track makes for the Caspian by way of the Ural River and so leads to the Persian Gulf, while two more are lost sight of on the steppes. The fifth (E) mounts the Jennesai to Lake Baikal and so passes into Mongolia. The sixth (F) ascends the Lena and striking the Upper Amoor reaches the Sea of Japan, where it coalesces with the seventh (G) and eighth (O) which run from the eastern portion of Siberia and Kamchátka. Besides these the ninth (X) starting from Greenland and Iceland, passes by the Færoes to the British Islands and so joining the second (B) and third (C), runs down the French coast."

All these routes are plainly laid down on the map which accompanies the work, and in the absence of more precise information, it will hardly be in the power of any British ornithologist to dispute them, though, as before stated, we must hold them to be in a great measure conjectural. In the following chapters the author shows how necessary it is to know the principal routes taken by birds in their migrations before we can understand or reason intelligibly on their movements, and of very great interest are his remarks on the Genetic Import of Regular and Irregular Lines of Travel, and on the So-called Migratory Instinct (chaps. ix. and x.), greatly amplified in the German version from the brief paragraphs which represent them in the Swedish original. They are, however, it must be confessed, somewhat verbose; but, for all that, they are well worth reading. Though Herr Palmén refers to an article which appeared in these columns some years ago (*NATURE*, vol. x. p. 415), he does not seem to be aware of the theory subsequently propounded by Mr. Wallace (vol. x. p. 459) as to the possible or probable origin of migratory habits, wherein is expressed, in far fewer words than his own, what appears to be essentially the same thing. For "Migratory Instinct" Herr Palmén substitutes "Experience" as the piloting power, and though there is much to be said in favour of this explanation in many cases, others there are in which it seems to break down utterly. How do the young cuckoos which stay in this country a month or six weeks after their parents (whom, let us remember, they have never known) have departed find their way to Africa? And how do the scores, hundreds, or thousands of rapacious and wading birds, whose elders do not accompany them, manage in their autumnal journeys to arrive more or less punctually at the spot which countless generations of their predecessors have reached before them? They have had no "experience," and though doubtless many perish by the way, a very large proportion year after year hit off exactly, and at the first intention, the ancestral landing-place. What, also, can "experience," which, after all, means only a knowledge of landmarks, do for the species which travel by night, as seems to be the habit of very many birds, or for those which, like at least two of the annual visitants to New Zealand, traverse a waste of waters? At present no solution of the mystery offers itself, at present such knowledge may be too wonderful for us; but, high as it is, our faith in the progress of science forbids us to say that we cannot attain unto it.

### OUR BOOK SHELF

*Dynamics; or, Theoretical Mechanics, in Accordance with the Syllabus of the Science and Art Department.* By J. T. Bottomley, M.A., F.R.S.E., F.C.S. (London and Glasgow: William Collins, Sons, and Co., 1877.)

THIS little text-book is issued by Messrs. Collins as one of their Elementary Science Series, and will prove useful to beginners, by rendering them familiar, at an early stage of their studies, with the more precise definitions and nomenclature which have been introduced by modern writers on dynamics. The distinction, for instance, between the centre of gravity and the centre of inertia is much more clearly pointed out than is usual in elementary works, and the statement that "there is only a limited number of classes of bodies that possess a centre of gravity" will probably be read by many with surprise. The measurement, composition, and resolution of velocities are treated of in the chapter preceding that on force, and the methods of measuring forces in terms either of gravitation units or absolute units are well and fully discussed. The definition of work given in the last chapter might, we think, be amended. As it stands at present it might lead the student to suppose that no work is done by an agent moving a body, unless the motion is created in opposition to a resisting force, though the language employed in some of the examples would be sufficient to correct such a supposition. Throughout the work the author assists the student to obtain "clear physical conceptions regarding the first principles of dynamics," by frequently directing his attention to the experimental proofs of the various laws he enunciates, and by hinting at the physical, rather than the mathematical, developments of his subject.

On these grounds, we have formed a very favourable opinion of Mr. Bottomley's work, and we have no doubt that it will meet with the success it deserves among a wider class of students than that for which it is specially designed.

A. R.

### LETTERS TO THE EDITOR

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#### Evolution and the Vegetable Kingdom

MR. CARRUTHERS has embodied in the *Contemporary Review* the substance of his Presidential addresses to the Geologists' Association, on which we would offer a few points for consideration.

Although not agreeing with Mr. Carruthers as to the inferences to be drawn from the present state of our knowledge of fossil vegetable remains, we cannot but admire the earnestness with which he makes a stand in what we regard as a losing cause. We set a high value on his researches in fossil botany, and his work is characterised by unvarying and careful exactitude. Whatever may be his theories, his reputation will rest on a solid basis of work. Palæontologists have to thank him for unvarying kindness and readiness to aid them in their researches, forming a marked exception to the treatment which botanists usually give the subject.

In discussing this question, we must keep well in mind the teaching of Sir Charles Lyell, first as to the insufficiency of the geological record, especially with regard to land-surfaces. Considering the denudation and the wasting action of the waves to which remnants of terrestrial conditions are exposed during the slow process of their submergence beneath the sea, and again during their gradual upheaval, it is surprising to us not that so few records are preserved, but that any vestiges whatever remain. Secondly, with regard to lapse of time, we must get the "chill of poverty out of our bones," and not misinterpret "the sign of successive events, and conclude that thousands of years were implied where the language of nature imports millions." Mr. Carruthers admits the imperfection of the geological record, although scarcely with sufficient emphasis, and compares its fragmentary condition to a tablet containing